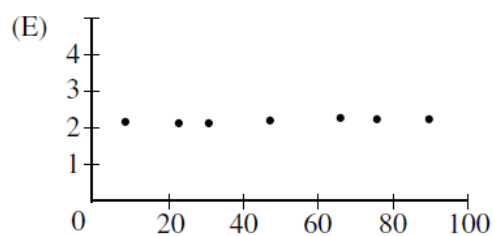
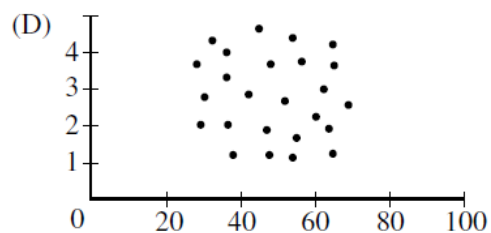
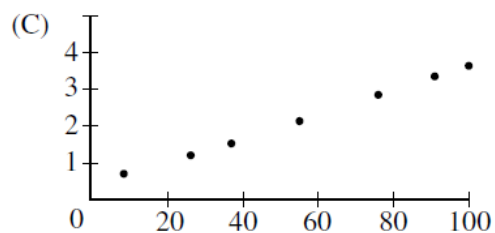
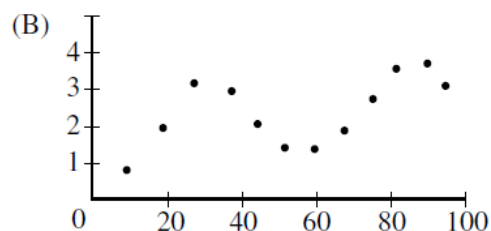
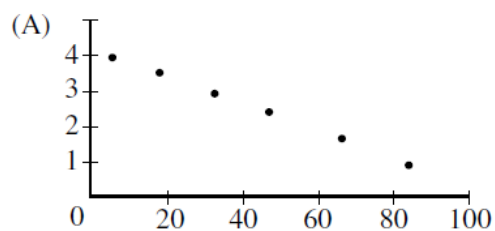
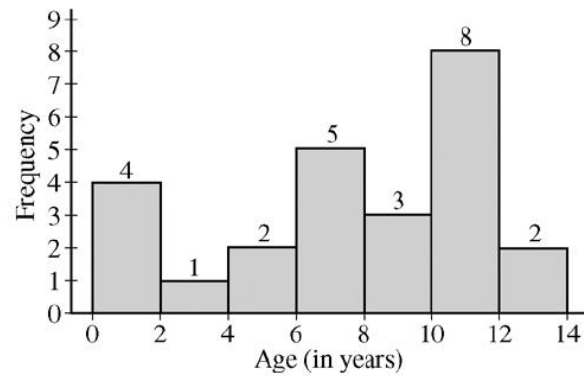


10. Which of the following scatterplots could represent a data set with a correlation coefficient of $r = -1$?



14. A random sample of 25 households from the Mountainview School District was surveyed. In this survey, data were collected on the age of the youngest child living in each household. The histogram below displays the data collected in the survey.



In which of the following intervals is the median of these data located?

- (A) 0 years old to less than 2 years old
- (B) 4 years old to less than 6 years old
- (C) 6 years old to less than 8 years old
- (D) 8 years old to less than 10 years old
- (E) 10 years old to less than 12 years old

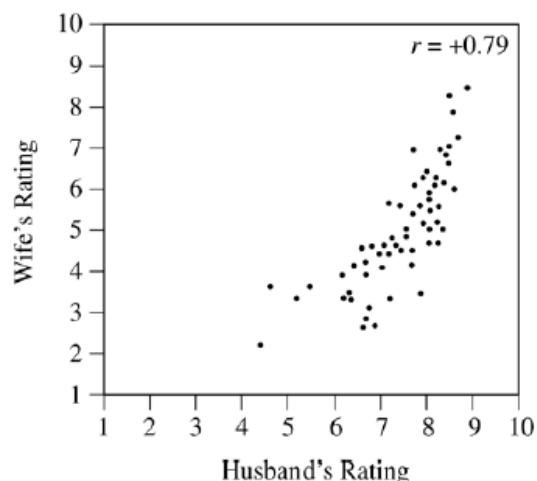
Questions 18-19 refer to the following scenario and set of data.

In the 1830s, land surveyors began to survey the land acquired in the Louisiana Purchase. Part of their task was to note the sizes of trees they encountered in their surveying. The table of data below is for bur oak trees measured during the survey.

Tree Diameter (in inches)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
4	2	0.005	2	0.005
5	5	0.012	7	0.016
6	19	0.044	26	0.060
7	5	0.012	31	0.072
8	41	0.095	72	0.167
9	12	0.028	84	0.195
10	53	0.123	137	0.318
11	3	0.007	140	0.325
12	64	0.148	204	0.473
13	4	0.009	208	0.483
14	46	0.107	254	0.589
15	11	0.026	265	0.615
16	48	0.111	313	0.726
17	2	0.005	315	0.731
18	47	0.109	362	0.840
19				
20	30	0.070	392	0.910
21				
22	4	0.009	396	0.919
23				
24	18	0.042	414	0.961
25				
26	1	0.002	415	0.963
27				
28	2	0.005	417	0.968
29				
30	8	0.019	425	0.986
31				
32				
33				
34	1	0.002	426	0.988
35	1	0.002	427	0.991
36	3	0.007	430	0.998
37				
38	1	0.002	431	1.000

18. Which of the following differences in cumulative relative frequencies gives the proportion of trees that are 12 inches to 16 inches, inclusive, in diameter?
- (A) $0.615 - 0.325$
- (B) $0.615 - 0.473$
- (C) $0.726 - 0.325$
- (D) $0.726 - 0.473$
- (E) $0.731 - 0.325$

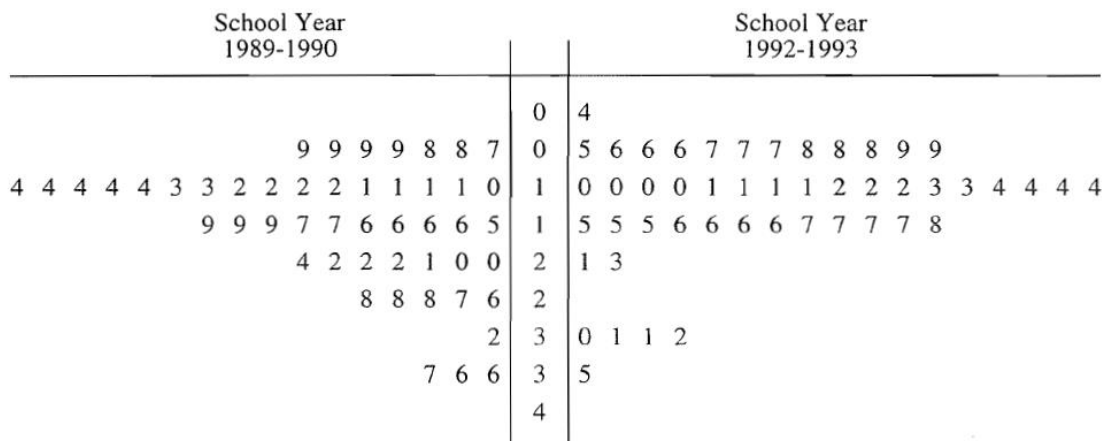
28. In a recent survey, 60 randomly selected married couples from the same town were asked to rate the overall quality of living in their town on a scale from 1 (very poor) to 10 (excellent) on twenty different attributes such as accessibility to major highways, availability of entertainment, services provided by tax dollars, etc. For each couple, the husband's individual ratings on the twenty attributes were averaged to produce an overall quality rating, and that process was repeated for the wife. Each point on the scatterplot below displays the overall rating of one of the 60 couples with the husband's rating represented by the horizontal axis and the wife's rating represented by the vertical axis.



Based on the scatterplot, which of the following statements is true?

- (A) Husbands tended to rate the quality of living higher than their wives did.
- (B) More overall ratings of 7 or less were assigned by husbands than by wives.
- (C) The range in the husbands' overall ratings is greater than the range in the wives' overall ratings.
- (D) The difference in overall ratings between a husband and wife was not more than 3 for any couple.
- (E) For each couple, the overall rating assigned by the husband was the same as the overall rating assigned by the wife.

22. The back-to-back stem-and-leaf plot below gives the percentage of students who dropped out of school at each of the 49 high schools in a large metropolitan school district.



For 1992-1993, 1|2 represents 12%.

Which of the following statements is NOT justified by these data?

- (A) The drop-out rate decreased in each of the 49 high schools between the 1989-1990 and 1992-1993 school years.
 - (B) For the school years shown, most students in the 49 high schools did not drop out of high school.
 - (C) In general, drop-out rates decreased between the 1989-1990 and 1992-1993 school years.
 - (D) The median drop-out rate of the 49 high schools decreased between the 1989-1990 and 1992-1993 school years.
 - (E) The spread between the schools with the lowest drop-out rates and those with the highest drop-out rates did not change much between the 1989-1990 and 1992-1993 school years.
1. Caffeine, a chemical found in many popular beverages, is known for reducing fatigue. A student wanted to investigate the caffeine content in popular beverages, such as soft drinks, energy drinks, tea, and coffee. The following data collected by the student show the amounts of caffeine (in milligrams per 12-ounce serving) for twelve popular beverages.

72 55 34 45 38 70 7.5 165 80 105 40 35

- (a) Construct an appropriate graphical display of the amounts of caffeine found in the twelve beverages.
- (b) Use the graph in part (a) to write a few sentences describing the distribution of caffeine content for the twelve beverages.
- (c) A 12-ounce cup of one popular gourmet coffee contains over 300 milligrams of caffeine. If this value was added to the data set of twelve numbers above, how would the mean and median of the data set above compare with the mean and median of the new data set with the thirteen numbers? Explain how this comparison could be made without performing any computations.

